

**Remarks by the Honorable Sean O'Keefe
NASA Administrator
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Thank you Elliot (Elliot Pulhman, President, U.S. Space Foundation) for that very gracious introduction. I certainly appreciate your warm welcome on this, my second visit as NASA Administrator to the symposium.

Those of you who were at the symposium last year will probably remember vividly, as do I, the wonderful tribute that General Eberhart presented in honor of our nation's military astronauts.

Today, our nation has cause for optimism as their military colleagues have made significant strides to guarantee world peace by toppling a regime that was dedicated to oppression, terrorism and threatened world stability. The President has exerted remarkable leadership and the military force has responded brilliantly.

Now it was a bit over two months ago--although it somehow seems like a much longer time--that our entire country and the world came to appreciate the dedication and heroism of seven more astronauts, the courageous members of the STS-107 crew.

On their 16-day mission of exploration and discovery, our Columbia astronauts demonstrated once again through their joyful and determined pursuit of knowledge on behalf of all humanity that great lives are defined by great purposes. We miss them more than words can say.

In their mission dedicated to scientific research, Rick Husband, Willie McCool, Mike Anderson, Dave Brown, Kalpana Chawla, Laurel Clark, and Ilan Ramon worked tirelessly on experiments aimed at fighting cancer, improving crop yields, developing fire-suppression techniques, building earthquake resistant buildings and understanding the effects of dust storms on the weather.

We will never forget their contributions, and we will honor their legacy by learning from this setback and moving forward with safe flight operations that will advance the noble goals motivating our space research and exploration agenda.

Human history teaches us that in exploration, after accidents like this occur, we learn from them and further reduce risks, although we must honestly admit that risks can never be eliminated. President John F. Kennedy observed once some 41 years ago, speaking about our fledgling space program at that time, "All great and honorable actions are accompanied with great difficulties, and both must be enterprised and overcome with answerable courage."

Our first task, of course, is to help the independent Columbia Accident Investigation Board determine the cause or causes of the accident and all necessary remedies. In this work, we are making significant progress both in terms of data analysis and also in terms of debris recovery.

In the countryside of eastern Texas and western Louisiana, for example, recovery teams have found nearly 30 percent of the orbiter, including 442 parts from the left wing, and the critical Orbiter Experimental Recorder.

I have made three trips to Texas to thank the personnel from over 20 agencies who are helping with the recovery effort.

Let me tell you, we owe these people a tremendous debt of gratitude. Many of the recovery team members are with the U.S. Forest Service right here in Colorado. Last summer, you knew these dedicated people as the folks who were protecting Colorado Springs and other front-range communities from several devastating forest fires.

This winter, they went without hesitation to the much flatter landscape of Texas with nothing more than their tents and sleeping bags. Without their support, the 600,000-acre search area could not be adequately searched.

Among the Forest Service volunteers are many Native Americans who hail from tribes throughout the Rocky Mountain West. Recently, astronaut John Herrington, a proud member of two great organizations--the Chickasaw Nation of Oklahoma and United States Navy--visited several of their encampments.

John relished the opportunity to talk to these tremendous volunteers about his space flight on the STS-112 mission last year and the importance of continuing our exploration and discovery work.

If you think about it, is there any better place to talk about the profound work we are all engaged in to help expand the human reach into the heavens than by a campfire underneath a sea of stars?

I should add that also helping us in the recovery effort on the ground are personnel from the EPA, FEMA, the FBI, Defense Department, the Texas and Louisiana National Guards and state and local law enforcement and emergency service units.

Sadly, two of the recovery team volunteers, helicopter pilot Buzz Mier of Arizona and Texas Forest Service Ranger Charles Krenek lost their lives in an accident two weeks ago, reminding all of us that in addition to our brave troops now engaged in operation Iraqi Freedom, we owe so much to the public servants right here in the U.S. who selflessly serve us every day.

I plan to go back to Texas next week to meet with and thank the volunteers and the community members who have been so welcoming and hospitable to our people. Their support has been incredible.

A few days ago, I was told a story about how one night a group of NASA folks were having dinner one night in a local restaurant in Lufkin, Texas. An 11-year old girl approach them and said, "I want you know how sorry we are for your loss, but how proud of you we are about NASA and what you do for our country.

In this difficult period, the outpouring of support we've received from Americans like this young lady has given us the strength we need to persevere and move forward. I personally have heard from thousands of ordinary people who want us to continue progressing with human spaceflight activities, and to do so with the utmost regard for safety and the lessons learned from the Columbia accident. And that's exactly what we will do.

Of course, most inspiring to us are the families of the astronauts. I was with them as they visited with the President just before the Iraqi campaign began and it was meaningful for us to be with the President as he took the time to meet with us prior to the beginning of Operation Iraqi Freedom.

It is instructive, I think, to put our situation in historical perspective. Two hundred years ago our Nation's third president, Thomas Jefferson, sent a confidential letter to Congress, asking for the huge sum at the time of \$2,500 to fund an expedition up the Missouri River to explore the newly acquired Louisiana Purchase Lands.

Soon after, President Jefferson summoned his close friend Meriwether Lewis to the White House, and asked him to lead, along with William Clark, an epic adventure that would span the entire continent.

The Lewis and Clark Expedition was not undertaken without a proper regard for the peril that the Corps of Discovery would encounter as they entered vast, forbidding uncharted territories. But President Jefferson did not shy away from the challenge.

The stories that Lewis and Clark brought back from their two year journe--of exotic plant and animal species, of vast mountain ranges and swiftly flowing rivers, and of a flourishing

civilization of Native American tribes--opened the minds of our young Nation's citizens to an age of new possibilities.

Three years after the Lewis and Clark expedition was first conceived, another explorer whose name people around here well know left St. Louis to explore the southern portion of the Louisiana Purchase. In late November of 1806 Army Lieutenant Zebulon Pike set foot in this region and climbed 9,000 foot tall Cheyenne Peak which is a stone's throw from here. From there he eyed the peak that would eventually bear his name, believing it would be impossible for humans to climb.

Of course Zebulon Pike was proved wrong in that judgment, and those history buffs among you certainly know that his expedition was not the best planned and executed voyage of discovery in the annals of exploration.

But despite many hardships, and a few missteps in the Spanish held territory in the Southwest, Pike did persevere and his journeys did help acquaint his fellow countrymen with the beauty and promise of this glorious landscape, leading to its eventual settlement and the gold rush that would define the frontier character of the Pike's Peak region.

This has obviously been a difficult period in our efforts to explore and extend our reach into the New Frontier of space. But despite our setbacks, we are moving forward in our efforts to open new pathways of exploration and discovery. There will be better days ahead.

Indeed, today is a good day. Your strong attendance at the symposium demonstrates for a much wider audience the significance of space to our Nation's economic health, security, and scientific leadership position.

Furthermore, in Washington today, some of our top scientists are meeting to write another page in the storied history of planetary exploration. The experts on our Mars exploration team are gathering to decide the eventual landing sites for the twin Mars Rover spacecraft that will launch to the Red Planet in May and June.

Four potential locations are still in the running. Three of the possible landing sites show evidence for surface processes involving water, and appear capable of addressing our science objectives of determining if water was present on the surface of Mars and whether there are conditions favorable to the preservation of evidence of ancient life. A fourth potential site appears to contain ancient terrain, which may hold clues to Mars' early climate when conditions may have been wetter.

When the Rovers arrive at Mars next year our entire country will be able to participate via the internet in the real-time exploration of a mysterious world whose stark beauty many have compared to that of the American southwest.

That's not all that we will be doing to continue pioneering the Space Frontier and advance our space research agenda in the days ahead, in this the Centennial of Flight year.

Later this month we will be launching the Space InfraRed Telescope, or SIRTf, the fourth and final of our first generation of great observatories. SIRTf will help us peer into star and planet-forming regions found in the cold dusty expanse of space, and to image the most distant galaxies in the universe.

We will also soon be launching the Galaxy Evolution Explorer satellite, which will conduct an all-sky ultraviolet survey to hopefully detect millions of galaxies in the far horizon.

And throughout the months ahead, we will be launching a number of important Earth science satellites and instruments that will help us better understand the complex climate of our own oasis in space.

With the backdrop of the Columbia tragedy still much in our minds, another key element of our space activity continues. We should all keep in mind, even as we look forward to these ambitious satellite missions, at this very moment t our Expedition Six crew onboard the International Space Station--Astronauts Ken Bowersox and Don Pettit and Cosmonaut Nikolai Budarin--continue to conduct the important scientific research that is this remarkable facility is enabling. Thus far, more than sixty experiments spanning across such scientific disciplines as human physiology, genetics, plant biology, earth observations, physics, and cell biology have been conducted.

From these experiments, scientists are learning better methods of drug testing, and about dynamic models of human diseases, the physics of fundamental processes in manufacturing, antibiotic synthesis, and changes in Earth climate, vegetation, and crops.

Our Space Station crew members are also learning a great deal about the physical and psychological challenges of living and working in space, gaining knowledge that will help pave the way for future human exploration of the solar system. Even with the limited Space Station crew sizes that we are planning for until the Shuttle's are able to fly again, this research will continue.

Now all of this research and the projects I mentioned, of course, will help us make significant progress toward our mission goals of understanding and protecting the home planet, exploring the Universe and searching for life, and inspiring the next generation of explorers.

Please let me emphasize that while we wait for the findings of the independent Columbia Accident Investigation Board, which will serve as our guide for resuming safe Shuttle flight operations, we are already beginning to take prudent and preliminary steps to prepare for a return to flight.

We have begun our "return to flight" planning efforts in order to be ready to implement the findings of the Columbia Accident Investigation Board, and Admiral Gehman fully understands our logic for taking this course.

Our return to flight planning analysis will look across the entire Space Shuttle program and evaluate possible improvements for safety and flight operations that we were considering prior to the Columbia accident.

Dr. Michael Greenfield, our Associate Deputy Administrator for Technical Programs, and former astronaut Bill Readdy, our Associate Administrator for Space Flight, will head our Return to Flight Team. Astronaut James Halsell, a veteran of five Shuttle missions, will lead the day-to-day work for Return to Flight. This team will be composed of a number of key officials and safety professionals from within NASA and industry, no doubt including many people who are here today. Their experience in shuttle operations and the investigation to date will provide a sound foundation for this vital activity.

Also, we are moving ahead with actions to assure the service lifetime of the remaining Shuttle orbiters. Last month, members of the NASA-industry Shuttle team met in New Orleans for the first Space Shuttle Service Life Extension Program Summit, an event that was planned prior to the loss of Columbia. The participants in the summit developed a list of candidate upgrades for the Shuttle system, and are developing a process to list by priority those improvements to assure safe, efficient Shuttle operations.

This work on assuring the life of the Space Shuttle orbiters will help us to plan for flying the Shuttle safely and effectively through at least the middle of the next decade until we can field another means of sending humans into space.

While we are very focused now on returning the Shuttle safely to flight, we should all recognize that the Shuttle exists in a larger context. This is a context that we've addressed through NASA's Integrated Space Transportation Plan, our roadmap for the next 20 years of human spaceflight, and through NASA's Strategic Plan, which ties all of our long-term activities to our vision and mission goals. During the days that followed the Columbia accident, some people asked me whether the accident would force us to reconsider these plans. A test of any long-term plan is whether it can accept the inevitable setbacks and still achieve its goals. And we're confident both the Integrated Space Transportation Plan and Strategic Plans will serve to benefit the national interest in the years ahead.

The Integrated Space Transportation Plan, which was introduced last November by the President, was supported by Congress in last year's appropriations measure and is now in the current proposal the President has advanced for the budget for the next fiscal year, will address our Nation's near and mid-term requirements in human space flight by making investments to extend the Shuttle's operational life for continued safe operations.

In parallel we will forge ahead with the development of a new Orbital Space Plane to provide a crew transfer capability as early as possible to assure access to and from the International Space Station and with next-generation launch vehicle technology in such areas as propulsion,

structures, and operations.

Just as the Integrated Space Transportation Plan provides us a logical means to address our near-term human spaceflight needs, our Strategic Plan will help NASA, with the support of industry and the American people, logically extend our research and exploration horizons.

Building on the foundation of our ongoing capabilities and anticipating future technology breakthroughs, the Strategic Plan sets out how we intend to achieve our mission goals and create a true highway to space in the years ahead.

This plan, which was developed by NASA experts who represent all our centers and enterprise functions, envisions and expanding human and robotic presence throughout the solar system as we move forward with a combination of stepping stone missions and the building blocks of transformational technologies and capabilities.

The Strategic Plan is designed to enable us to reach any number of destinations in the solar system, do important science at those destinations, and also tangibly advance economic and technological progress in the process.

One of the exciting potentials we're looking at is the use of gravitationally balanced points in the Sun-Earth system, to better enable the 21st century exploration of the Moon, asteroids, Mars and the moons of Jupiter, and the construction and servicing of huge next generation space telescopes.

This may not happen right away, but we are confident that we can utilize these libration points for more ambitious science and exploration missions that will allow us to take a stepping-stone approach ever outward, with sophisticated robots enhancing what our human explorers set out to do.

Significantly, the future we are planning is driven by our most profound scientific questions. Questions such as: How did the universe, galaxies, stars, and planets form and evolve? How can the exploration of the universe and our solar system revolutionize our understanding of physics, chemistry, and biology? What will the future climate of Earth be like? Are there Earth-like planets beyond our solar system? Does life in any form, however simple or complex, carbon-based or other, exist elsewhere than on planet Earth?

With your help we will answer those questions and establish a legacy of achievement that will be as lasting and majestic as the sight of Pike's Peak at sunrise. You should be extraordinarily proud you are a part of this effort.

Let me assure you of another thing. I'm not talking about a visionary dream that is not grounded in reality. We are pursuing a number of critical tasks and building block technologies to ensure that several bold scientific goals are achievable in the decades ahead.

For example, we are using the International Space Station and ground research to look at how we can address the long-term health issues of crews exposed to radiation in space.

This research will examine potential alternatives to active or passive shielding for future missions, and whether or not artificial gravity is needed for deep space exploration missions.

We also intend to learn from the experience of astronauts and explorers of remote Earth sites such as Antarctica, to help our future explorers cope with the challenging physiological and psycho-social aspects of long-term missions.

Someday we hope to use the Space Station as a technology proving ground where astronauts can learn how with the help of robots to construct and maintain large scientific platforms such as telescopes that could give us clear views of Earth-like planets orbiting nearby stars.

Another of our objectives for future space exploration activities is to develop new propulsion systems that will significantly enhance the ability of our robotic spacecraft to perform scientific investigations of the planets.

Currently, by using conventional propulsion, it takes years for our spacecraft to get to the outer planets, and once they approach their destinations, they can only do rewarding science for a few weeks or months at best.

Using nuclear and other advance propulsion systems we believe we can do much better.

Nuclear propulsion will enable exploration missions that are inconceivable with current conventional chemical propulsions. Missions can, for the first time, be redirected to take advantage of circumstances as they unfold, just as Lewis and Clark redirected their voyage two centuries ago when it became clear there was no single water passage to the Pacific Ocean.

On Project Prometheus, our first planned nuclear fission mission, we will send a spacecraft on a complex, multiple orbit examination of Jupiter's icy moons. We also believe that the pursuit of nuclear and other advanced propulsion technologies will open the door to other power generation and propulsion technologies that may make feasible an even faster pathway to the future. And when our future spacecraft go out to the planets, they may also be using another transformative technology we're working on in the realm of laser communications. Following in the same progression that led from the Telegraph to the Telephone, our Optical Communications initiative will use laser light instead of radio waves to revolutionize gather and report back information to scientists here on Earth.

This technology will be demonstrated on a Mars orbiting mission in six years. If successful, we will be able to map the entire surface of Mars in four months. Today, using conventional radio frequency communications, the Mars Reconnaissance Orbiter will take 21 months to map 20 percent of the red planet's surface.

It is technological capabilities today that will open up untold avenues of scientific inquiry. That's what NASA's work is all about.

I'd like to conclude my remarks today by adding my voice of congratulations to the recipients of the Space Foundation's three premier achievement awards--the Astronauts Memorial Foundation, the U.S. Air Force/Boeing/Lockheed-Martin Evolved Expendable Launch Vehicle Team and space artist Robert McCall. I hope all of you have had the opportunity to visit the Astronauts Memorial Foundation's Space Mirror at the Kennedy Space Center. This beautiful national memorial reminds all of us of the courage and the dedication of all our astronauts who have died in the exploration of space and in training.

Fittingly, the Astronauts Memorial Foundation is one of NASA's best partners in our work to advance our mission goal of inspiring the next generation of explorers. The Space Foundation has noted with approval, as do I, the terrific work the Astronauts Memorial Foundation is doing to take technologies derived from NASA's space missions and showing school boards and teachers how they can be used as teaching tools in the classroom. And through the Foundation's Center for Space Education, they are proving to have a major influence on the future of education in the U.S.

Similarly, the Air Force/Boeing/Lockheed-Martin Evolved Expendable Launch Vehicle team is having a major impact on expanding our nation's space launch capabilities for civil, commercial and national defense missions. I can assure you that NASA hopes to tap into this capability on future planetary exploration missions and other space science missions as well.

Finally, for those of us whose dreams of spaceflight have been inspired by the colorful palate of Robert McCall, I am delighted that Bob is the recipient of the Douglas Morrow Public Outreach award. This year, Bob is helping us commemorate the Centennial of Flight with a beautiful mural slated for placement in our Dryden Flight Research Facility that documents the history of flight from the Wright Flyer to the International Space Station.

We should all take note, I think, that in the grand scheme of things, one hundred years is a very short period of time. In that blink of an eye we've gone from Kitty Hawk to Tranquility Base and now look forward to our rovers traversing the surface of Mars. Despite the challenges we face, the future we envision, like the future depicted in the artwork of Bob McCall, is a future of boundless possibility. I thank all of you for what you are doing to bring that future about, and for the honor of speaking to you this morning.

